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SEQUENCE LISTING

#1

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Ozkaynak, Engin

<120> Osteogenic Devices

<130> STK-008CN

<140> US 09/754,831
<141> 2001-01-03

<150> US 08/375,901
<151> 1995-01-20

<150> US 08/145,812
<151> 1993-11-01

<150> US 07/995,345
<151> 1992-12-22

<150> US 07/315,342
<151> 1989-02-23

<150> US 07/232,630
<151> 1988-08-15

<150> US 07/179,406
<151> 1988-04-08

<160> 72

<170> PatentIn version 3.0

<210> 1
<211> 96
<212> PRT
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<220>
<223> Biosynthetic Protein COP5

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Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala
1 5 10 15

Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro
20 25 30

Leu Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu
35 40 45

Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr
50 55 60

Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val
65 70 75 80

Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg
85 90 95

<210> 2
<211> 96
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<220>
<223> Biosynthetic protein COP7

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Pro Pro Gly Tyr His Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro
20 25 30

Leu Ala Asp His Leu Asn Ser Thr Asn His Ala Val Val Gln Thr Leu
35 40 45

Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr
50 55 60

Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val
65 70 75 80

Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg
85 90 95

<210> 3
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<220>
<223> endochondral bone formation inducing protein

<220>
<221> misc_feature
<223> wherein Xaa at positions 2, 4, 6, 8, 11, 12, 14, 15, 16, 18, 20, 21
, 23, 26, 28, 30, 31, 33, 34, 35, 36, 37, 38, 39, 40, 44, 45, 47,
48, 50, 51, 52, 54, 55, 56, 57, 59, 60, 63, 65, 66, 67, 68, 69,
70, 71, 72, 75, 76, 77, 78, 79, 80, 82, 84, 85, 87, 88, 90, 92, 93,
95, and 97 is any amino acid

<400> 3

Leu Xaa Val Xaa Phe Xaa Asp Xaa Gly Trp Xaa Xaa Trp Xaa Xaa Xaa
1 5 10 15

Pro Xaa Gly Xaa Xaa Ala Xaa Tyr Cys Xaa Gly Xaa Cys Xaa Xaa Pro
            20   25   30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala Xaa Xaa Gln Xaa Xaa
        35   40   45

Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa Xaa Cys Cys Xaa Pro
    50   55   60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa
65   70   75   80

Val Xaa Leu Xaa Xaa Tyr Xaa Xaa Met Xaa Val Xaa Xaa Cys Xaa Cys
                85   90   95

Xaa

<210> 4
<211> 102
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<220>
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<223> wherein Xaa at positions 2, 3, 4, 5, 7, 9, 11, 13, 16, 17, 19, 20, 21, 23, 25, 26, 28, 31, 33, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 49, 50, 52, 53, 55, 56, 57, 59, 60, 61, 62, 64, 65, 68, 70, 71, 72, 73, 74, 75, 76, 77, 79, 80, 81, 82, 83, 84, 8587, 89, 90, 92, 93, 95, 97, 98, 100 and 102 is any amino acid

<400> 4

Cys Xaa Xaa Xaa Xaa Leu Xaa Val Xaa Phe Xaa Asp Xaa Gly Trp Xaa
1   5   10   15

Xaa Trp Xaa Xaa Xaa Pro Xaa Gly Xaa Xaa Ala Xaa Tyr Cys Xaa Gly
            20   25   30

Xaa Cys Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala
        35   40   45

Xaa Xaa Gln Xaa Xaa Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa
    50   55   60

Xaa Cys Cys Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa
65   70   75   80

Xaa Xaa Xaa Xaa Xaa Val Xaa Leu Xaa Xaa Tyr Xaa Xaa Met Xaa Val
                85   90   95

Xaa Xaa Cys Xaa Cys Xaa
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<210> 5
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<220>
<223> endochondral bone formation inducing protein

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<220>
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<223> wherein Xaa at position 6 is an arginine, a serine, a lysine or an alanine

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<223> wherein Xaa at position 8 is a valine, a leucine or an isoleucine

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<223> wherein Xaa at position 11 is an asparagine, a glutamine, an aspa rtic acid or a serine

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<223> wherein Xaa at position 12 is a aspartic acid, glutamic acid or an asparagine

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<223> wherein Xaa at position 14 is an isoleucine or a valine

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<220>
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<223> wherein Xaa at position 16 is an alanine or a serine

<220>
<221> misc_feature
<223> wherein Xaa at position 18 is a proline, a glutamic acid, a leuci
ne or a lysine

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<223> wherein Xaa at position 20 is a tyrosine or a phenylalanine

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<223> wherein Xaa at position 21 is a hiostidine or an aspartic acid

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<223> wherein Xaa at position 23 is a phenylalanine, a tyrosine or an
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<223> wherein Xaa at position 26 is a histidine, a glutamic acid or a
serine

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<223> wherein Xaa at position 28 is a glutamic acid or an alanine

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<223> wherein Xaa at position 31 is a phenylalanine or a tyrosine

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<223> wherein Xaa at position 33 is a leucine, a methionine or an
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<221> misc_feature
<223> wherein Xaa at position 34 is an alanine, a proline or a threonine

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<223> wherein Xaa at position 35 is an aspartic acid, a glutamic acid or a lysine

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<223> wherein Xaa at position 36 is a histidine or a serine

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<223> wherein Xaa at position 37 is a leucine, a methionine or a phenyl alanine

<220>
<221> misc_feature
<223> wherein Xaa at position 38 is an asparagine or a lysine

<220>
<221> misc_feature
<223> wherein Xaa at position 39 is a serine, an alanine or a proline

<220>
<221> misc_feature
<223> wherein Xaa at position 40 is a threonine or a serine

<220>
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<223> wherein Xaa at position 44 is an isoleucine, a valine or a threonine

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<223> wherein Xaa at position 45 is a valine, an isoleucine or a leucine

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<223> wherein Xaa at position 47 is a threonine or a serine

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<223> wherein Xaa at position 48 is a leucine or an isoleucine

<220>
<221> misc_feature
<223> wherein Xaa at position 50 is an asparagine, a histidine or an arginine

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<223> wherein Xaa at position 51 is a serine, an alanine, a phenylalani
ne or an asparagine

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<223> wherein Xaa at position 52 is a valine or an isoleucine

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<223> wherein Xaa at position 54 is a proline or a serine

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<223> wherein Xaa at position 55 is a glycine or a glutamic acid

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<223> wherein Xaa at position 56 is a lysine, a glutamine, a threonine
or a serine

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<223> wherein Xaa at position 57 is an isoleucine or a leucine

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<223> wherein Xaa at position 67 is a leucine or a glutamine

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<223> wherein Xaa at position 68 is a serine, a methionine or an

aspartic acid

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<223> wherein Xaa at position 71 is a serine or a leucine

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<223> wherein Xaa at position 72 is a methionine, an alanine or a valine

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<223> wherein Xaa at position 79 is a glutamine, a glutamic acid, a serine or a lysine

<220>
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<223> wherein Xaa at position 80 is an asparagine or an aspartic acid

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<223> wherein Xaa at position 83 is a leucine or an isoleucine

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<223> wherein Xaa at position 85 is an asparagine, an arginine or a his
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<220>
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<223> wherein Xaa at position 86 is a tyrosine or a lysine

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<223> wherein Xaa at position 88 is an aspartic acid, a glutamic acid
or an asparagine

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<223> wherein Xaa at position 89 is a methionine or a glutamic acid

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<223> wherein Xaa at position 92 is a glutamic acid or an arginine

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<223> wherein Xaa at position 93 is a glycine, an aspartic acid, a seri
ne or a glutamic acid

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<223> wherein Xaa at position 94 is a cysteine or an alanine

<220>
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<223> wherein Xaa at position 96 is a cysteine or a histidine

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Leu Xaa Val Xaa Phe Xaa Asp Xaa Gly Trp Xaa Xaa Trp Xaa Xaa Xaa
1 5 10 15

Pro Xaa Gly Xaa Xaa Ala Xaa Tyr Cys Xaa Gly Xaa Cys Xaa Xaa Pro
20 25 30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala Xaa Xaa Gln Xaa Xaa
35 40 45

Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa Xaa Cys Cys Xaa Pro
50 55 60

Thr Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Xaa Xaa Xaa Xaa Xaa Xaa
65 70 75 80

Xaa Val Xaa Lys Xaa Xaa Xaa Xaa Xaa Val Xaa Xaa Xaa Gly Xaa Arg
85 90 95

His

<210> 6
<211> 101
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<223> endochondral bone formation inducing protein

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<223> wherein Xaa at position 5 is a proline, a serine, a glutamic acid or a glutamine

<220>
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<223> wherein Xaa at position 7 is a tyrosine, a lysine or a phenylalanine

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<223> wherein Xaa at position 9 is an aspartic acid, a serine or a glut
amic acid

<220>
<221> misc_feature
<223> wherein Xaa at position 11 is an arginine a serine, a lysine or
an alanine

<220>
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<223> wherein Xaa at position 13 is a valine, a leucine or an isoleucine

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<223> wherein Xaa at position 16 is an asparagine, a glutamine, an aspa
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<223> wherein Xaa at position 17 is an aspartic acid, a glutamic acid
or an asparagine

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<223> wherein Xaa at position 19 is an isoleucine or a valine

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<223> wherein Xaa at position 20 is a valine or an isoleucine

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<223> wherein Xaa at position 21 is an alanine or a serine

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<223> wherein Xaa at position 23 is a proline, a glutamic acid, a leuci
ne or a lysine

<220>
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<223> wherein Xaa at positon 26 is a histidine or an aspartic acid

<220>
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<223> wherein Xaa at position 28 is a phenylalanine, a tyrosine or an asparagine

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<223> wherein Xaa at position 31 is a histidine, a glutamic acid or a serine

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<223> wherein Xaa at position 33 is a glutamic acid or an alanine

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<223> wherein Xaa at position 35 is a proline, a glutamine or an alanine

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<223> wherein Xaa at position 35 is a proline, a glutamine or an alanine

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<223> wherein Xaa at position 38 is a leucine, a methionine oe an isole ucine

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<223> wherein Xaa at position 39 is an alanine, a proline or a threonine

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<223> wherein Xaa at position 40 is an aspartic acid, a glutamic acid or a lysine

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<223> wherein Xaa at position 43 is an asparagine or a lysine

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<223> wherein Xaa at position 44 is a serine, an alanine or a proline

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<223> wherein Xaa at position 56 is a serine, an alanine, a phenylalani ne or an asparagine

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<223> wherein Xaa at position 59 is a serine or a proline

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<223> wherein Xaa at position 60 is a glycine or a glutamic acid

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<223> wherein xaa at position 61 is a lysine, a glutamine, a threonine or a serine

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<223> wherein Xaa at position 64 is a lysine or a glutamic acid

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<223> wherein Xaa at position 65 is an alanine, a proline or a serine

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<223> wherein Xaa at position 68 is a valine or an alanine

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tic acid

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<223> wherein Xaa at position 74 is an alanine, a serine or a proline

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<223> wherein Xaa at position 75 is an isoleucine, a leucine or a valine

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<223> wherein Xaa at position 76 is a serine or an alanine

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<223> wherein Xaa at position 77 is a methionine, a valine or an isoleu
cine

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<223> wherein Xaa at position 79 is a phenylalanine or a tyrosine

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<223> wherein Xaa at position 80 is a leucine, a tyrosine or a phenylal
anine

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<223> wherein Xaa at position 81 is an aspartic acid or an asparagine

<220>
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<223> wherein Xaa at position 82 is a glutamic acid, an asparagine or
an aspartic acid

<220>
<221> misc_feature
<223> wherein Xaa at position 83 is a glutamine or an asparagine

<220>

<221> misc_feature
<223> wherein Xaa at position 84 is a glutamic acid, a glutamine, a ser
ine or a lysine

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<221> misc_feature
<223> wherein Xaa at position 85 is an asparagine or a lysine

<220>
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<223> wherein Xaa at position 87 is a leucine or an isoleucine

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<223> wherein Xaa at position 89 is a lysine or an arginine

<220>
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<223> wherein Xaa at position 90 is an asparagine, a lysine or a histid
ine

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<223> wherein Xaa at position 92 is a glutamine, a glutamic acid, an
arginine or a proline

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<223> wherein Xaa at position 93 is an aspartic acid, a glutamic acid
or an asparagin

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<223> wherein Xaa at position 95 is a valine or a threonine

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<223> wherein Xaa at position 97 is a glutamic acis, an aspartic acid
or an arginin

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<223> wherein Xaa at position 98 is a glycine, an alanine, a serine or
a glutamic acid

<220>
<221> misc_feature

<223> wherein Xaa at position 100 is a glycine or a histidine

<220>
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<223> wherein Xaa at position 102 is a an arginine or a histidine

<400> 6

Cys Xaa Xaa Xaa Xaa Leu Xaa Asp Phe Xaa Asp Xaa Gly Trp Xaa Xaa
1 5 10 15

Trp Xaa Xaa Xaa Pro Xaa Gly Xaa Xaa Ala Xaa Tyr Cys Xaa Gly Xaa
20 25 30

Cys Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala Xaa
35 40 45

Xaa Gln Xaa Xaa Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa Xaa
50 55 60

Cys Cys Xaa Pro Thr Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Tyr Xaa Xaa
65 70 75 80

Xaa Xaa Xaa Xaa Xaa Val Xaa Lys Xaa Xaa Xaa Xaa Xaa Val Xaa Xaa
85 90 95

Xaa Xaa Gly Xaa Arg
100

<210> 7
<211> 102
<212> PRT
<213> Artificial Sequence

<220>
<223> Vg1 protein sequence with osteogenic activity

<400> 7

Cys Lys Lys Arg His Leu Tyr Val Glu Phe Lys Asp Val Gly Trp Gln
1 5 10 15

Asn Trp Val Ile Ala Pro Gln Gly Tyr Met Ala Asn Tyr Cys Tyr Gly
20 25 30

Glu Cys Pro Tyr Pro Leu Thr Glu Ile Leu Asn Gly Ser Asn His Ala
35 40 45

Ile Leu Gln Thr Leu Val His Ser Ile Glu Pro Glu Asp Ile Pro Leu
50 55 60

Pro Cys Cys Val Pro Thr Lys Met Ser Pro Ile Ser Met Leu Phe Tyr
65 70 75 80

Asp Asn Asn Asp Asn Val Val Leu Arg His Tyr Glu Asn Met Ala Val

85 90 95

Asp Glu Cys Gly Cys Arg
100

<210> 8
<211> 102
<212> PRT
<213> Artificial Sequence

<220>
<223> DPP protein sequence with osteogenic activity

<400> 8

Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp
1 5 10 15

Asp Trp Ile Val Ala Pro Leu Gly Tyr Asp Ala Tyr Tyr Cys His Gly
20 25 30

Lys Cys Pro Phe Pro Leu Ala Asp His Phe Asn Ser Thr Asn His Ala
35 40 45

Val Val Gln Thr Leu Val Asn Asn Asn Asn Pro Gly Lys Val Pro Lys
50 55 60

Ala Cys Cys Val Pro Thr Gln Leu Asp Ser Val Ala Met Leu Tyr Leu
65 70 75 80

Asn Asp Gln Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val
85 90 95

Val Gly Cys Gly Cys Arg
100

<210> 9
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> OP1 protein sequence with osteogenic activity

<400> 9

His Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg
1 5 10 15

Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala
20 25 30

Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met Asn
35 40 45

Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn Pro
50 55 60

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Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala Ile
65                  70                  75                  80

Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr
                85                  90                  95

Arg Asn Met Val Val Arg Ala Cys Gly Cys His
            100                 105
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<210> 10
<211> 103
<212> PRT
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<220>
<223> CBP-2a protein sequence with osteogenic activity

<400> 10

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Cys Lys Arg His Pro Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn
1               5                   10                  15

Asp Trp Ile Val Ala Pro Pro Gly Tyr His Ala Phe Tyr Cys His Gly
            20                  25                  30

Glu Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala
        35                  40                  45

Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala
    50                  55                  60

Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Tyr
65                  70                  75                  80

Leu Asp Glu Asn Glu Lys Val Val Leu Lys Asn Tyr Gln Asp Met Val
                85                  90                  95

Val Glu Gly Cys Gly Cys Arg
            100
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<210> 11
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<220>
<223> CBMP-2b protein sequence with osteogenic activity

<400> 11

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Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asn
1               5                   10                  15

Asp Trp Ile Val Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys His Gly
            20                  25                  30
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Asp Cys Pro Phe Pro Leu Ala Asp His Leu Asn Ser Thr Asn His Ala
        35                  40                  45

Ile Val Gln Thr Leu Val Asn Ser Val Asn Ser Ile Pro Lys Ala Cys
    50                  55                  60

Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu
65                  70                  75                  80

Tyr Asp Lys Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly
                85                  90                  95

Cys Gly Cys Arg
            100
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<210> 12
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<212> PRT
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<220>
<223> CBMP-3

<400> 12

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Cys Ala Arg Arg Tyr Leu Lys Val Asp Phe Ala Asp Ile Gly Trp Ser
1               5                   10                  15

Glu Trp Ile Ile Ser Pro Lys Ser Phe Asp Ala Tyr Tyr Cys Ser Gly
            20                  25                  30

Ala Cys Gln Phe Pro Met Pro Lys Ser Leu Lys Pro Ser Asn His Ala
        35                  40                  45

Thr Ile Gln Ser Ile Val Arg Ala Val Gly Val Val Pro Gly Ile Pro
    50                  55                  60

Glu Pro Cys Cys Val Pro Glu Lys Met Ser Ser Leu Ser Ile Leu Phe
65                  70                  75                  80

Phe Asp Glu Asn Lys Asn Val Val Leu Lys Val Tyr Pro Asn Met Thr
                85                  90                  95

Val Glu Ser Cys Ala Cys Arg
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<210> 13
<211> 98
<212> PRT
<213> Artificial Sequence

<220>
<223> COP1

<400> 13

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Leu Tyr Val Asp Phe Gln Arg Asp Val Gly Trp Asp Asp Trp Ile Ile
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1               5                   10                  15

Ala Pro Val Asp Phe Asp Ala Tyr Tyr Cys Ser Gly Ala Cys Gln Phe
            20                  25                  30

Pro Ser Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr
        35                  40                  45

Leu Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val
    50                  55                  60

Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Ser
65                  70                  75                  80

Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val Val Gly Cys Gly
                85                  90                  95

Cys Arg
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<210> 14
<211> 98
<212> PRT
<213> Artificial Sequence

<220>
<223> COP3

<400> 14

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Leu Tyr Val Asp Phe Gln Arg Asp Val Gly Trp Asp Asp Trp Ile Val
1               5                   10                  15

Ala Pro Pro Gly Tyr Gln Ala Phe Tyr Cys Ser Gly Ala Cys Gln Phe
            20                  25                  30

Pro Ser Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr
        35                  40                  45

Leu Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val
    50                  55                  60

Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu
65                  70                  75                  80

Lys Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly
                85                  90                  95

Cys Arg
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<210> 15
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<212> PRT
<213> Artificial Sequence

<220>

<223> COP4

<400> 15

Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala
1 5 10 15

Pro Pro Gly Tyr Gln Ala Phe Tyr Cys Ser Gly Ala Cys Gln Phe Pro
20 25 30

Ser Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu
35 40 45

Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val Pro
50 55 60

Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
65 70 75 80

Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys
85 90 95

Arg

<210> 16
<211> 97
<212> PRT
<213> Artificial Sequence

<220>
<223> COP16

<400> 16

Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala
1 5 10 15

Pro Pro Gly Tyr Gln Ala Phe Tyr Cys Ser Gly Ala Cys Gln Phe Pro
20 25 30

Ser Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu
35 40 45

Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val Pro
50 55 60

Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
65 70 75 80

Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys
85 90 95

Arg

<210> 17

<223> COP4

<400> 15

Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala
1 5 10 15

Pro Pro Gly Tyr Gln Ala Phe Tyr Cys Ser Gly Ala Cys Gln Phe Pro
20 25 30

Ser Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu
35 40 45

Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val Pro
50 55 60

Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
65 70 75 80

Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys
85 90 95

Arg

<210> 16
<211> 97
<212> PRT
<213> Artificial Sequence

<220>
<223> COP16

<400> 16

Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala
1 5 10 15

Pro Pro Gly Tyr Gln Ala Phe Tyr Cys Ser Gly Ala Cys Gln Phe Pro
20 25 30

Ser Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu
35 40 45

Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val Pro
50 55 60

Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
65 70 75 80

Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys
85 90 95

Arg

<210> 17

<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 17

Ser Phe Asp Ala Tyr Tyr Cys Ser Gly Ala Cys Gln Phe Pro Met Pro
1 5 10 15

Lys

<210> 18
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 18

Ser Leu Lys Pro Ser Asn Tyr Ala Thr Ile Gln Ser Ile Val
1 5 10

<210> 19
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 19

Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu
1 5 10 15

Asp Glu Asn Glu Lys
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<210> 20
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 20

Met Ser Ser Leu Ser Ile Leu Phe Phe Asp Glu Asn Lys
1 5 10

<210> 21
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 21

Ser Gln Glu Leu Tyr Val Asp Phe Gln Arg
1 5 10

<210> 22
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 22

Phe Leu His Cys Gln Phe Ser Glu Arg Asn Ser
1 5 10

<210> 23
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 23

Thr Val Gly Gln Leu Asn Glu Gln Ser Ser Glu Pro Asn Ile Tyr
1 5 10 15

<210> 24
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 24

Leu Tyr Asp Pro Met Val Val
1 5

<210> 25
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 25

Val Gly Val Val Pro Gly Ile Pro Glu Pro Cys Cys Val Pro Glu
1 5 10 15

<210> 26
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 26

Val Asp Phe Ala Asp Ile Gly
1 5

<210> 27
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 27

Val Pro Lys Pro Cys Cys Ala Pro Thr
1 5

<210> 28
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 28

Ile Asn Ile Ala Asn Tyr Leu
1 5

<210> 29
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 29

Asp Asn His Val Leu Thr Met Phe Pro Ile Ala Ile Asn
1 5 10

<210> 30
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at position 15 is any amino acid

<400> 30

Asp Glu Gln Thr Leu Lys Lys Ala Arg Arg Lys Gln Trp Ile Xaa Pro
1 5 10 15

<210> 31
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at positions 4 and 10 is any amino acid

<400> 31

Asp Ile Gly Xaa Ser Glu Trp Ile Ile Xaa Pro
1 5 10

<210> 32
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at positions 15 and 16 is any amino acid

<400> 32

Ser Ile Val Arg Ala Val Gly Val Pro Gly Ile Pro Glu Pro Xaa Xaa
1 5 10 15

Val

<210> 33
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at position 2 is any amino acid

<400> 33

Asp Xaa Ile Val Ala Pro Pro Gln Tyr His Ala Phe Tyr
1 5 10

<210> 34
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 34

Asp Glu Asn Lys Asn Val Val Leu Lys Val Tyr Pro Asn Met Thr Val
1 5 10 15

Glu

<210> 35
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at positions 13 and 16 is any amino acid

<400> 35

Ser Gln Thr Leu Gln Phe Asp Glu Gln Thr Leu Lys Xaa Ala Arg Xaa
1 5 10 15

Lys Gln

<210> 36
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at position 19 is any amino acid

<400> 36

Asp Glu Gln Thr Leu Lys Lys Ala Arg Arg Lys Gln Trp Ile Glu Pro
1 5 10 15

Arg Asn Xaa Ala Arg Arg Tyr Leu
20

<210> 37
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at positions 12, 14, 17 and 18 is any amino acid

<400> 37

Ala Arg Arg Lys Gln Trp Ile Glu Pro Pro Asn Xaa Ala Xaa Arg Tyr
1 5 10 15

Xaa Xaa Val Asp
20

<210> 38
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<223> wherein Xaa at positions 2, 8, 10, 12, 13, 19, 21 and 22 is any amino acid

<400> 38

Arg Xaa Gln Trp Ile Glu Pro Xaa Asn Xaa Ala Xaa Xaa Tyr Leu Lys
1 5 10 15

Val Asp Xaa Ala Xaa Xaa Gly
20

<210> 39
<211> 97
<212> PRT
<213> Artificial Sequence

<220>
<223> OP1 shorter sequence

<400> 39

Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala
1 5 10 15

Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro
20 25 30

Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu
35 40 45

Val His Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro
50 55 60

Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn
65 70 75 80

Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys
85 90 95

His

<210> 40
<211> 4805
<212> DNA
<213> Artificial Sequence

<220>
<223> genomic sequence of OP1

<220>
<221> misc_feature
<223> approximately 1000 bases are missing between position
1882 and 1883

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aagcagactg ccgttttcta tatgggatga gccttcacag ggcagccagt tgggatgggt 240

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caccagcccg cagagctaag gttgggtgga cattagggtt ggttgatcca ggagctcaac 360

agtgtcctct gagccccagc tccttctgcc ccaccccacc atcttcagtg ctgcttcctc 420

tcaaggccac agctgtagtt ggccaggggg gcttcattat tttttgctcc tgggcagtag 480

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<213> Artificial Sequence

<220>
<223> consensus probe

<400> 41
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cacttcaaca gcaccaacca cgccgtggtg cagaccctgg tgaacaacat gaaccccggc 180

aaggtaccca agccctgctg cgtgcccacc gagctgtccg ccatcagcat gctgtacctg 240

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<210> 42
<211> 314
<212> DNA
<213> Artificial Sequence

<220>
<223> OP1 gene

<400> 42
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<210> 43
<211> 315
<212> DNA
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<220>
<223> Gene probe for osteogenic protein

<220>
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Asp Trp Ile Ile Ala Pro Val Asp Phe Asp Ala Tyr Tyr Cys Ser Gly
20 25 30

gcc tgc cag ttc ccc tct gcg gat cac ttc aac agc acc aac cac gcc 144
Ala Cys Gln Phe Pro Ser Ala Asp His Phe Asn Ser Thr Asn His Ala

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gtg gtg cag acc ctg gtg aac aac atg aac ccc ggc aag gta ccc aag      192
Val Val Gln Thr Leu Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys
    50                  55                  60

ccc tgc tgc gtg ccc acc gag ctg tcc gcc atc agc atg ctg tac ctg      240
Pro Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu
65                  70                  75                  80

gac gag aat tcc acc gtg gtg ctg aag aac tac cag gag atg acc gtg      288
Asp Glu Asn Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val
                85                  90                  95

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Val Gly Cys Gly Cys Arg
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<210> 44
<211> 102
<212> PRT
<213> Artificial Sequence

<400> 44

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1               5                   10                  15

Asp Trp Ile Ile Ala Pro Val Asp Phe Asp Ala Tyr Tyr Cys Ser Gly
            20                  25                  30

Ala Cys Gln Phe Pro Ser Ala Asp His Phe Asn Ser Thr Asn His Ala
        35                  40                  45

Val Val Gln Thr Leu Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys
    50                  55                  60

Pro Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu
65                  70                  75                  80

Asp Glu Asn Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val
                85                  90                  95

Val Gly Cys Gly Cys Arg
            100
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<210> 45
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> Hinge region

<400> 45

Asp Pro Asn Gly
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<210> 46
<211> 106
<212> PRT
<213> Artificial Sequence

<220>
<223> beta-inhibin-a

<400> 46

Cys Cys Lys Lys Gln Phe Phe Val Ser Phe Lys Asp Ile Gly Trp Asn
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Asp Trp Ile Ile Ala Pro Ser Gly Tyr His Ala Asn Tyr Cys Glu Gly
20 25 30

Glu Cys Pro Ser His Ile Ala Gly Thr Ser Gly Ser Ser Leu Ser Phe
35 40 45

His Ser Thr Val Ile Asn His Tyr Arg Met Arg Gly His Ser Pro Phe
50 55 60

Ala Asn Leu Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met Ser
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Met Leu Tyr Tyr Asp Asp Gly Gln Asn Ile Ile Lys Lys Asp Ile Gln
85 90 95

Asn Met Ile Val Glu Glu Cys Gly Cys Ser
100 105

<210> 47
<211> 105
<212> PRT
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<220>
<223> beta-inhibin-b

<400> 47

Cys Cys Arg Gln Gln Phe Phe Ile Asp Phe Arg Ile Gly Trp Asn Asp
1 5 10 15

Trp Ile Ile Ala Pro Thr Gly Tyr Tyr Gly Asn Tyr Cys Glu Gly Ser
20 25 30

Cys Pro Ala Tyr Leu Ala Gly Val Pro Gly Ser Ala Ser Ser Phe His

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        35                  40                  45

Thr Ala Val Val Asn Gln Tyr Arg Met Arg Gly Leu Asn Pro Gly Thr
    50                  55                  60

Lys Val Asn Ser Cys Cys Ile Pro Thr Lys Leu Ser Thr Met Ser Met
65                  70                  75                  80

Leu Tyr Phe Asp Asp Glu Tyr Asn Ile Val Lys Arg Asp Val Pro Asn
                85                  90                  95

Met Ile Val Glu Glu Cys Gly Cys Ala
            100                 105
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<210> 48
<211> 99
<212> PRT
<213> Artificial Sequence

<220>
<223> TGF-beta-1

<400> 48

```
Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp
1               5                   10                  15

Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly
            20                  25                  30

Pro Cys Pro Tyr Ile Trp Ser Leu Leu Asp Thr Gln Tyr Ser Lys Val
        35                  40                  45

Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys
    50                  55                  60

Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly
65                  70                  75                  80

Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys
                85                  90                  95

Lys Cys Ser
```

<210> 49
<211> 99
<212> PRT
<213> Artificial Sequence

<220>
<223> TGF-beta-2

<400> 49

```
Cys Cys Leu Arg Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp
1               5                   10                  15
```

```
Lys Trp Ile His Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly
            20                  25                  30

Ala Cys Pro Tyr Leu Trp Ser Leu Ser Asp Thr Gln His Ser Arg Val
        35                  40                  45

Leu Ser Leu Tyr Asn Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys
    50                  55                  60

Cys Val Ser Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly
65                  70                  75                  80

Lys Thr Pro Lys Ile Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys
                85                  90                  95

Lys Cys Ser
```

<210> 50
<211> 99
<212> PRT
<213> Artificial Sequence

<220>
<223> TGF-beta-3

<400> 50

```
Cys Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp
1               5                   10                  15

Lys Trp Val His Glu Pro Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly
            20                  25                  30

Pro Cys Pro Tyr Leu Arg Ser Leu Ala Asp Thr Thr His Ser Thr Val
        35                  40                  45

Leu Gly Leu Tyr Asn Thr Leu Asn Pro Glu Ala Ser Ala Ser Pro Cys
    50                  55                  60

Cys Val Pro Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Val Gly
65                  70                  75                  80

Arg Thr Pro Lys Val Glu Gln Leu Ser Asn Met Val Val Lys Ser Cys
                85                  90                  95

Lys Cys Ser
```

<210> 51
<211> 99
<212> PRT
<213> Artificial Sequence

<220>
<223> MIS

<400> 51

Cys Ala Leu Arg Glu Leu Ser Val Asp Leu Arg Ala Glu Arg Ser Val
1 5 10 15

Leu Ile Pro Glu Thr Tyr Gln Ala Asn Asn Cys Gln Gly Val Cys Gly
20 25 30

Trp Pro Gln Ser Asp Arg Asn Pro Arg Tyr Gly Asn His Val Val Leu
35 40 45

Leu Leu Lys Met Gln Ala Arg Gly Ala Ala Leu Ala Arg Pro Pro Cys
50 55 60

Cys Val Pro Thr Ala Tyr Ala Gly Lys Leu Leu Ile Ser Leu Ser Glu
65 70 75 80

Glu Arg Ile Ser Ala His His Val Pro Asn Met Val Ala Thr Glu Cys
85 90 95

Gly Cys Arg

<210> 52
<211> 103
<212> PRT
<213> Artificial Sequence

<220>
<223> Alpha-inhibin

<220>
<221> misc_feature
<223> wherein Xaa at position 93 is a threonine, a valine or a proline

<400> 52

Cys His Arg Val Ala Leu Asn Ile Ser Phe Gln Glu Leu Gly Trp Glu
1 5 10 15

Arg Trp Ile Val Tyr Pro Pro Ser Phe Ile Phe His Tyr Cys His Gly
20 25 30

Gly Cys Gly Leu His Ile Pro Pro Asn Leu Ser Leu Pro Val Pro Gly
35 40 45

Ala Pro Pro Thr Pro Ala Gln Pro Tyr Ser Leu Leu Pro Gly Ala Gln
50 55 60

Pro Cys Cys Ala Ala Leu Pro Gly Thr Met Arg Pro Leu His Val Arg
65 70 75 80

Thr Thr Ser Asp Gly Gly Tyr Ser Phe Lys Tyr Glu Xaa Asn Leu Leu
85 90 95

```
Thr Gln His Cys Ala Cys Ile
            100


<210>  53
<211>  861
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  COP-5 fusion protein

<220>
<221>  CDS
<222>  (1)..(852)

<400>  53
atg aaa gca att ttc gta ctg aaa ggt tca ctg gac aga gat ctg gac       48
Met Lys Ala Ile Phe Val Leu Lys Gly Ser Leu Asp Arg Asp Leu Asp
1               5                   10                  15

tct cgt ctg gat ctg gac gtt cgt acc gac cac aaa gac ctg tct gat       96
Ser Arg Leu Asp Leu Asp Val Arg Thr Asp His Lys Asp Leu Ser Asp
            20                  25                  30

cac ctg gtt ctg gtc gac ctg gct cgt aac gac ctg gct cgt atc gtt      144
His Leu Val Leu Val Asp Leu Ala Arg Asn Asp Leu Ala Arg Ile Val
        35                  40                  45

act ccc ggg tct cgt tac gtt gcg gat ctg gaa ttc atg gct gac aac      192
Thr Pro Gly Ser Arg Tyr Val Ala Asp Leu Glu Phe Met Ala Asp Asn
    50                  55                  60

aaa ttc aac aag gaa cag cag aac gcg ttc tac gag atc ttg cac ctg      240
Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu
65                  70                  75                  80

ccg aac ctg aac gaa gag cag cgt aac ggc ttc atc caa agc ttg aag      288
Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys
                85                  90                  95

gat gag ccc tct cag tct gcg aat ctg cta gcg gat gcc aag aaa ctg      336
Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys Leu
            100                 105                 110

aac gat gcg cag gca ccg aaa tcg gat cag ggg caa ttc atg gct gac      384
Asn Asp Ala Gln Ala Pro Lys Ser Asp Gln Gly Gln Phe Met Ala Asp
        115                 120                 125

aac aaa ttc aac aag gaa cag cag aac gcg ttc tac gag atc ttg cac      432
Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His
    130                 135                 140

ctg ccg aac ctg aac gaa gag cag cgt aac ggc ttc atc caa agc ttg      480
Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu
145                 150                 155                 160
```

```
aag gat gag ccc tct cag tct gcg aat ctg cta gcg gat gcc aag aaa      528
Lys Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys
                165                 170                 175

ctg aac gat gcg cag gca ccg aag gat cct aat ggg ctg tac gtc gac      576
Leu Asn Asp Ala Gln Ala Pro Lys Asp Pro Asn Gly Leu Tyr Val Asp
            180                 185                 190

ttc agc gac gtg ggc tgg gac gac tgg att gtg gcc cca cca ggc tac      624
Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala Pro Pro Gly Tyr
        195                 200                 205

cag gcc ttc tac tgc cat ggc gaa tgc cct ttc ccg cta gcg gat cac      672
Gln Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu Ala Asp His
    210                 215                 220

ttc aac agc acc aac cac gcc gtg gtg cag acc ctg gtg aac tct gtc      720
Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu Val Asn Ser Val
225                 230                 235                 240

aac tcc aag atc cct aag gct tgc tgc gtg ccc acc gag ctg tcc gcc      768
Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala
                245                 250                 255

atc agc atg ctg tac ctg gac gag aat gag aag gtg gtg ctg aag aac      816
Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val Leu Lys Asn
            260                 265                 270

tac cag gag atg gta gta gag ggc tgc ggc tgc cgc taactgcag            861
Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg
        275                 280
```

<210> 54
<211> 284
<212> PRT
<213> Artificial Sequence

<400> 54

```
Met Lys Ala Ile Phe Val Leu Lys Gly Ser Leu Asp Arg Asp Leu Asp
1               5                   10                  15

Ser Arg Leu Asp Leu Asp Val Arg Thr Asp His Lys Asp Leu Ser Asp
            20                  25                  30

His Leu Val Leu Val Asp Leu Ala Arg Asn Asp Leu Ala Arg Ile Val
        35                  40                  45

Thr Pro Gly Ser Arg Tyr Val Ala Asp Leu Glu Phe Met Ala Asp Asn
    50                  55                  60

Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu
```

65 70 75 80

Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys
85 90 95

Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys Leu
100 105 110

Asn Asp Ala Gln Ala Pro Lys Ser Asp Gln Gly Gln Phe Met Ala Asp
115 120 125

Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His
130 135 140

Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu
145 150 155 160

Lys Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys
165 170 175

Leu Asn Asp Ala Gln Ala Pro Lys Asp Pro Asn Gly Leu Tyr Val Asp
180 185 190

Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala Pro Pro Gly Tyr
195 200 205

Gln Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu Ala Asp His
210 215 220

Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu Val Asn Ser Val
225 230 235 240

Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala
245 250 255

Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val Leu Lys Asn
260 265 270

Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg
275 280

<210> 55

<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> BOP

<400> 55

Ser Phe Asp Ala Tyr Tyr Cys Ser Gly Ala Cys Gln Phe Pro Ser
1 5 10 15

<210> 56
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> DPP

<400> 56

Gly Tyr Asp Ala Tyr Tyr Cys His Gly Lys Cys Pro Phe Phe Leu
1 5 10 15

<210> 57
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Vg1

<400> 57

Gly Tyr Met Ala Asn Tyr Cys Tyr Gly Glu Cys Pro Tyr Pro Leu
1 5 10 15

<210> 58
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> inhibin

<400> 49

Gly Tyr His Ala Asn Tyr Cys Glu Gly Glu Cys Pro Ser His Ile
1 5 10 15

<210> 59
<211> 15
<212> PRT
<213> Artificial Sequence

<220>

<223> TGF-beta

<400> 59

Gly Tyr His Ala Asn Phe Cys Leu Gly Pro Cys Pro Tyr Ile Trp
1 5 10 15

<210> 60
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> BOP

<400> 60

Lys Arg Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu
1 5 10 15

Tyr Leu Asp Glu Asn
20

<210> 61
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Vg1

<400> 61

Leu Pro Cys Cys Val Pro Thr Lys Met Ser Pro Ile Ser Met Leu Phe
1 5 10 15

Tyr Asp Asn Asn
20

<210> 62
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> inhibin

<400> 62

Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met Ser Met Leu Tyr
1 5 10 15

Tyr Asp Asp Gly
20

<210> 63
<211> 19

<212> PRT
<213> Artificial Sequence

<220>
<223> TGF-beta

<400> 63

Ala Pro Cys Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr
1 5 10 15

Tyr Val Gly

<210> 64
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> DPP

<400> 64

Lys Ala Cys Cys Val Pro Thr Gln Leu Asp Ser Val Ala Met Leu Tyr
1 5 10 15

Leu Asn Asp Gln
20

<210> 65
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> BOP

<400> 65

Leu Tyr Val Asp Phe
1 5

<210> 66
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> DPP

<400> 66

Leu Tyr Val Asp Phe
1 5

<210> 67

<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Vg1

<400> 57

Leu Tyr Val Glu Phe
1 5

<210> 68
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> TGF-beta

<400> 68

Leu Tyr Ile Asp Phe
1 5

<210> 69
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> inhibin

<400> 69

Phe Phe Val Ser Phe
1 5

<210> 70
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal sequence

<400> 70

Cys Lys Arg His Pro
1 5

<210> 71
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal sequence

<400> 71

Cys Arg Arg Lys Gln
1 5

<210> 72
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> N-terminal sequence

<400> 72

Cys Lys Arg His Glu
1 5